IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Examiner:	Parry, Christopher L.
Art Group:	2623
Reference No.:	BPCUR0001FA (C-1)
Appn. Filed:	April 20, 2001
Applicants:	Frank Allegrezza

Title: System and Method for Retrieving and Storing Multimedia Data

May 11, 2009

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia

Sir:

This Appeal Brief is being filed after a Notice of Appeal filed by Applicant February 11, 2009. This Appeal Brief accompanies a one-month Request for an Extension of Time and the appropriate fee. Only one copy of this appeal brief is being filed, in accordance with the requirements of MPEP §1205.02.

REAL PARTY IN INTEREST:

The real party in interest is Concurrent Computer Corporation, by way of an assignment executed by the inventor and recorded in the US Patent and Trademark Office on April 5, 2004 at reel 015178, frame 0116. Concurrent Computer Corporation, the assignee, is the owner of 100% interest. The mailing address for Concurrent Computer Corporation is 4375 River Green Parkway, Duluth, Georgia 30006.

RELATED APPEALS/INTERFERENCES:

This is the only pending appeal of this application. There are no pending interferences to the best knowledge of the Applicant.

STATUS OF CLAIMS:

Claims 1-52 were originally filed with this application. Claims 1, 2, 4-7, 9-14, 16-19, and 21-24 are currently pending in this application.

Claims 1, 2, 4-7, 9-14, 16-19, and 21-24 currently stand rejected under 35 USC §103(a) as being unpatentable over Rege, US Pat. No. 6,128,467, in view of Belknap et al., US Pat. No. 5,586,264, hereinafter "Belknap."

A listing of the claims appears at the end of this Appeal Brief.

The status of each individual claim is listed below:

Claim 1: Previously Presented; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 2: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 3: Canceled.

Claim 4: Previously Presented; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 5: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 6: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 7: Original; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 8: Canceled.

Claim 9: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 10: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 11: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 12: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 13: Previously Presented; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 14: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 15: Canceled.

Claim 16: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 17: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 18: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 19: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 20: Canceled.

Claim 21: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 22: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 23: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claim 24: Original as filed; Rejected under 35 USC §103(a) as unpatentable over Rege in view of Belknap; Appealed herein.

Claims 25-52: Canceled.

Claims 53-54: Withdrawn by the Examiner by way of "constructive election" in the Final Office Action mailed August 29, 2008.

STATUS OF AMENDMENTS:

Applicant filed an amendment on July 25, 2005, canceling originally filed claims 25-48 and 51-52 in response to a Restriction Requirement mailed June 23, 2005.

Applicant filed a second amendment on April 6, 2006, in response to an Office Action mailed October 6, 2005. In this amendment, Applicant amended only claim 16 for matters of form (to change its dependency).

Applicant filed a third response on March 12, 2007, in response to an Office Action mailed September 11, 2006. The claims were not amended. All independent claims remained as originally filed.

Applicant filed a fourth amendment, along with a Request for Continued Examination, on October 17, 2007, in response to a Final Office Action mailed June 13, 2007. In this amendment, Applicant amended independent claim 1 to include the limitations of original claims 3 and 8, which were concurrently canceled. Applicant further amended independent claim 13 to include the limitations of independent claims 15 and 20, which were concurrently canceled. Claims 4 and 16 were amended to change dependency in light of the cancellation of claims 3 and 15. Applicant added new claims 53 and 54.

Applicant filed a fifth response on June 30, 2008, in response to an Office Action mailed December 28, 2007. The claims were not amended.

A final Office Action was mailed August 29, 2008, from which this Appeal is being filed.

No other amendments have been made in this case.

SUMMARY OF CLAIMED SUBJECT MATTER:

Where reference to the specification and figures is required in this summary, reference will be made to the application as published, i.e., US Published Application No. 2002/0157113.

Briefly, this invention, as set forth in the independent claims, recites a method (FIG. 2A, 2B, generally, and paragraphs [033]-[035]) and system (FIG. 1, generally, and paragraphs [017]-[028]) for storing data (FIG. 3B, paragraph [041]) on a plurality of storage devices (FIG. 1, element 100, paragraph [017]). A request for retrieving data (FIG. 2B, element 250, paragraph [034]), e.g., video stream data (paragraph [026]), is received, and a processor (FIG. 1, elements 300, paragraph [020]) is designated for handling the request. Data provided by the designated processor is stored on the storage devices via a switch (FIG. 1, element 250, paragraph [006]). The switch independently routes the data to be stored directly from the designated processor to the storage devices (paragraph [018]), based on directory information created by the processor, e.g., based on the length and the amount of data to be stored (paragraph [026]).

While the paragraph above provides a summary of the invention, Applicant is aware that an Appeal Brief must include a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number and to the drawings, if any, by reference characters. While the paragraph above sets forth page numbers and figure references to the subject matter set forth in the independent claims, Applicant includes below a listing of the claims with reference to the specification and figures, including reference designators. Applicant's attorney has found in appellate practice that a recitation of the claims, with reference to the specification and figures, is frequently the most efficient way to satisfy the requirements of 37 CFR 41.37(c)(1)(b) and to get the brief to the Board.

Thus, turning now specifically to the independent claims, with reference to the specification and figures, each independent claim is set forth below:

1. A system (FIG. 1, generally) for retrieving data (FIG. 2A, element 210, paragraphs [033],[035]) distributed across a plurality of storage devices (FIG. 1, element 100, paragraphs [017]-[018]), the system comprising:

a plurality of processors (FIG. 1, element 300, paragraph [017]), wherein upon receipt of a request for retrieving data (FIG. 1, element 600, paragraph [026]), a processor is designated for handling the request (designated by FIG. 1, element 350 as set forth in paragraph [026]); and

a switch (FIG. 1, element 250, paragraph [019]) arranged between the processors and the storage devices (paragraph [018]), wherein the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data based on directory information obtained by the processor (paragraph [026]), and independently routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor, and wherein the data comprises video stream data (paragraph [026]-[027]).

13. A method for retrieving data (FIG. 2A, generally, paragraph [033]) distributed across a plurality of storage devices (FIG. 1, element 100, paragraphs [017]-[018]), the method comprising the steps of:

receiving a request for retrieving data (FIG. 2A, element 210, paragraph [033]), wherein the data comprises video stream data (paragraph [026]);

designating a processor for handling the request (FIG. 2A, element 220, paragraph [033]);

forwarding the request directly from the designated processor to the storage devices containing the data via a switch (paragraph [006], Abstract, paragraph [026]); and returning responses (paragraph [006]) from the storage devices directly to the designated processor via the switch (paragraph [026]), wherein the switch uses directory information obtained by the processor to independently route the request for retrieving data and the responses between the storage devices and the processor (paragraph [026], paragraph [033], Abstract).

SOLE GROUND TO BE REVIEWED ON APPEAL:

Whether claims 1, 2, 4-7, 9-14, 16-19, and 21-24 are patentable under 35 USC §103(a) over Rege, US Pat. No. 6,128,467, in view of Belknap, US Pat. No. 5,586,264.

ARGUMENT:

Comments on Grouping of Claims:

Claims 2, 4-7, and 9-12 each depend from claim 1. Claims 14, 16-19, and 21-24 each depend from claim 13. For the purposes of this Appeal, Applicant respectfully submits that claims 1, 2, 4-7, and 9-12 may be grouped together, with claim 1 as the exemplary claim, claims 13, 14, 16-19, and 21-24 may be grouped together, with claim 13 as the exemplary claim. In light of this grouping, Applicant's comments below will be directed to the exemplary claims 1 and 13.

Rejections to the Claims as set forth in the Final Office Action:

The final Office Action, mailed August 29, 2008, rejects claims 1, 2, 4-7, 9-14, 16-19, and 21-24 under 35 USC §103(a) as being unpatentable over Rege in view of Belknap.

Rejection to claim 1:

Specifically, with respect to claim 1, the final Office Action submits that Rege discloses a system for retrieving data distributed across a plurality of storage devices in FIG. 2 and at col. 3, lines 18-27. The final Office Action submits that Rege teaches a plurality of processors in FIG. 2, where upon receipt of the request for retrieving data, one processor is designated for handling the request at col. 3, lines 28-63 and col. 5, lines 64-67.

The final Office Action then submits that Rege discloses a switch in FIG. 2, arranged between the processors and the storage devices, that independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data and independently routes responses from the storage devices directly to the designated processor, where the data comprises a video stream at FIGS. 4 and 5, and at col. 3, lines 19-35, line 64 through col. 4, line 39, and col. 4, lines 56-67.

The final Office Action submits that Rege teaches servers to generate request packets that are sent to disks when a customer request is received in FIG. 2. The final Office Action submits that the request includes a header, disc address field, size field, server memory address field, and error correction field, without providing any citation to

Rege. The final Office Action then submits that disk address of Rege is the logical address of the portion of the selected multimedia to be transferred, citing Rege col. 6, lines 6-46.

The final Office Action acknowledges that Rege fails to teach a scenario in which the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data based upon directory information obtained by the processor, and independently routing responses from the storage devices directly to the designated processor, where the data comprises video stream data.

However, the final Office Action submits that Belknap, in analogous art, discloses a system in FIG. 1 for retrieving data distributed across a plurality of devices in FIG. 2 and at col. 6, lines 22-52. The final Office Action submits that Belknap teaches a switch in FIG. 1 that routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data based upon directory information at col. 7, lines 4-7 and 53-67, and at col. 8, lines 41-53 and col. 9, lines 8-31.

The final Office Action then concludes that it would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to combine Rege with Belknap "…for the benefit of providing an improved data retrieval system that can provide video data to customers in a more immediate fashion."

Applicant respectfully traverses this rejection.

Rejection to Claim 13:

With respect to claim 13, the final Office Action submits that Rege teaches a method for retrieving data across a plurality of storage devices at col. 3, lines 29-42. The final Office Action submits the method included receiving a request for retrieving data, where the data is video stream data at col. 3, lines 18-33, and designating a processor for handling the request at col. 4, lines 41-67, col. 5, lines 59-63, and col. 6, lines 39-46. The final Office Action submits that Rege teaches returning responses from the storage devices directly to the designated processor via the switch at col. 3, lines 33-35, where the switch independently routes the request for retrieving data and the responses between the storage devices and the processor at col. 3, lines 19-35, col. 3 line 64 through col. 4, line 39, and col. 4, lines 56-67.

The final Office Action acknowledges that Rege fails to teach forwarding the request directly from the designated processor to the storage devices containing the data via the switch. The final Office Action further acknowledges that Rege fails to teach the of a switch using directory information obtained by the processor to route requests.

The final Office Action then submits that Belknap teaches a method for retrieving data distributed across a plurality of storage devices at col. 17, lines 28-65. The final Office Action submits that Belknap's method includes receiving a request for data that is video data at col. 8, lines 32-35, forwarding the request directly from the designated processor to the storage devices at col. 8, lines 40-52, col. 9, lines 8-19, and col. 12, lines 57-62, and returning responses from the storage devices directly to the designated processor via the switch at col. 12, lines 57-59, where the switch uses directory information obtained by the processor to route the request for retrieving data and the responses between the storage devices and the processor at col. 7, lines 4-7 and lines 53-67, col. 8, lines 41-53, and col. 9, lines 8-31.

The final Office Action then concludes that it would have been obvious to one of ordinary skill in the art at the time Applicant's invention was made to combine Rege with Belknap "…for the benefit of providing an improved data retrieval system that can provide video data to customers in a more immediate fashion."

Applicant respectfully traverses the rejection.

Legal Standards:

Per MPEP §2142, "The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case of obviousness, the applicant is under no obligation to submit evidence of non-obviousness." "[I]mpermissable hindsight must be avoided and the legal conclusion must be reached on the basis of facts gleaned from the prior art." *Id.*

"The key to supporting any rejection under 35 USC §103 is the clear articulation of the reasons why the claimed invention would have been obvious." *Id.* "[T]he analysis supporting a rejection under 35 USC §103 should be made explicit…rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support a legal conclusion

of obviousness." *Id.*, citing *KSR International Co. v. Tele-flex Inc.* (KSR), 550 U.S. 398, 412 (2007), citing *In re Kahn*, 441 F. 3d 977, 988 (CA Fed. 2006).

Mere statements that a combination of references is combinable are insufficient to support a conclusion of obviousness. For example, "A statement that modifications of the prior art to meet the claimed invention would have been 'well within the ordinary skill of the art at the time the claimed invention was made' because the references relied upon teach all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references." MPEP §2143.01, citing *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

If a *prima facie* case of obviousness is made, the guidelines for determining obviousness are set forth in MPEP §2141, and are guided by the recent decision in the *KSR*. MPEP §2141 states that the Court in *KSR* "…reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966)". The *Graham* analysis requires, in addition to a determination of the scope and contents of the prior art, a determination of the differences between the prior art and an applicant's invention and the level of ordinary skill in the pertinent art. Where there are differences, an Office Action "…must explain why the difference(s) would have been obvious to one of ordinary skill in the art." *Id*. Specifically, there must be a "…clear articulation of the reason(s) why the claimed invention would have been obvious." *Id.*

In making the case for obviousness, the Examiner has the burden of establishing the case in a well-reasoned and articulate way. As set forth above, "To facilitate review, this analysis should be made explicit." *KSR* at 412, citing *In re Kahn*, *supra*. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.*

"When the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the examiner to explain why the combination of the teachings is proper." *Ex parte Skinner*, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1986). This burden is consistent with established guidelines set forth in MPEP §2142. "[T]he

examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985.

There is a reason the Court set forth this heightened requirement of explanation to sustain a conclusion of obviousness: the prevention of hindsight reasoning. "A fact finder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." *KSR* at 415, citing *Graham* at 36. Where an invention is contended to be obvious based upon a combination of references, one should be able to identify particular reasons that would have prompted one of ordinary skill in the art to combine the prior art elements. *See KSR* at 412-413. The requirement prevents the use of "…the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight." *Ecolochem, Inc. v. So. Cal. Edison Co*., 227 F.3d 1361, 1371-72 (Fed Cir. 2000) (quoting *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999)). "A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR* at 412. Emphasis added.

The burden also exists to ensure that references are not combined in a way that renders their function unworkable. "If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti*, 270 F.2d 810 (CCPA 1959).

Further, while *KSR* turned on a mere substitution of one element, the Court made it clear that in inventions involving more complicated modifications of prior art references, a more detailed analysis from the Examiner than that set forth in *KSR* is appropriate. Specifically, the Court states, "Following these principles may be more difficult in other cases than it is here because the claimed subject matter may involve more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement." *Id* at 411.

Applicant also notes, "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention."

MPEP §2141.03, citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). "A prima facie case of obviousness may also be rebutted by showing that the art, *in any material respect*, teaches away from the claimed invention." MPEP §2144.05, citing *In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997). This well established standard was affirmed in *KSR*. ("The Court relied upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious. *KSR* at 410, citing *United States v. Adams*, 383 U. S. 39, 40 (1966).)

Analysis:

1. No Prima Facie Case of Obviousness has been made:

Applicant begins by respectfully submitting that no *prima facie* case of obviousness has been made in this case. As set forth in the final Office Action, the Examiner has set forth a listing of elements contended by the Examiner to mirror Applicant's claims, with no clear articulation with rational underpinning explaining why the combination of Rege and Belknap is proper, or why one of ordinary skill in the art would have been motivated to combine Rege and Belknap to obtain Applicant's claimed invention without using Applicant's disclosure as hindsight. Applicant respectfully submits that a single sentence – "…for the benefit of providing an improved data retrieval system that can provide video data to customers in a more immediate fashion." – is insufficient and does not rise to the standard required for a *prima facie* case of obviousness set forth in MPEP §2142.

Applicant respectfully submits that this one-sentence rationale is nothing more than an attempt to demonstrate that as interpreted by the Examiner, elements of Applicant's invention were independently known in the prior art. Applicant respectfully traverses the Examiner's interpretation. Applicant further respectfully submits that the reasoning provided by the Examiner is not a clear articulation with a rational underpinning. As noted above, "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR* at 412, citing *In re Kahn*, *supra*.

For this reason alone, Applicant respectfully submits that Applicant's independent claims 1 and 13 are allowable over the combination of Rege and Belknap.

2. Additional Arguments:

Applicant notes that in accordance with MPEP §2142, "If the examiner does not produce a *prima facie* case of obviousness, the applicant is under no obligation to submit evidence of non-obviousness." Nonetheless, Applicant respectfully notes that it is a costly and time-consuming process to take an application to the Board. As such, the above reason for allowability notwithstanding, Applicant wishes to make additional substantive arguments against the combination of Rege and Belknap below.

Specifically, using the legal principles set forth above, Applicant respectfully traverses the rejections set forth above.

As set forth in its arguments filed on June 30, 2006, Applicant respectfully submits that as shown in FIG. 2, Rege discloses a switch 400 that connects servers 300 to disks 800. As set forth in Rege's specification at col. 3, lines 18-40, the switch 400 includes an "arbiter" for connecting servers 300 to disks 800. Rege states at col. 3, lines 34-35, "The operation of the switch 400 is controlled by the arbiter 600."

At col. 4, lines 31-39, Rege states that the arbiter responds to "switching requests." These switching requests, shown as element 700 in Rege FIG. 7, "…can include a destination address 701 and a source address 702 of the data being routed." Rege, col. 1, lines 1-5. Applicant respectfully submits that switching requests that include source and destination addresses are known in the art. They are, in fact, how conventional routers route data – a request having an address of the source and an address of specific data to be retrieved is received and routed accordingly. This is analogous to the US Mail, in which a postmaster routes mail based upon source and destination addresses printed on the mail. Rege's arbiter routes requests based upon address information already in a switching request.

By contrast, Applicant's invention in claims 1 and 13 recites *independently* routing requests and responses based upon directory information obtained by the processor. Applicant respectfully notes that this independent routing is distinct from the conventional routing disclosed by Rege. Further, "All the words in a claim must be

considered in judging the patentability of that claim against the prior art." MPEP §2143.03, citing *In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970).

Rege's teaching is clear. As disclosed at col. 3, lines 19-41, cited by the Examiner, Rege states the following:

> FIG. 2 shows a multimedia delivery system 200 according to a preferred embodiment of the invention. The system 200 comprises a plurality of servers 300 connected by a crosspoint switch 400 and a local area network (LAN) 210 to a plurality of disk storage systems 800. The servers 300 can be connected to the communications network 160 of FIG. 1 by lines 321. The switch 400 includes a request arbiter 600 explained in further detail below. The storage systems 800 can store multimedia content items such as movies, games, music, databases, and so forth.
>
> During operation of the system 200, demands for selected multimedia items are received from customers via the network 160. The servers 300, in response to the demands, generate data requests for the selected items. The requests are forwarded to the storage systems 800. The storage systems transfer the items to the servers 300 via the switch 400. The operation of the switch 400 is controlled by the arbiter 600. The arbiter 600 can receive switching requests via the LAN 210 from both the servers 300 and the disk systems 800. The arbiter 600 ensures that the selected items are appropriately routed between the servers 300 and the disk systems 800. The servers 300, in turn, present the selected items to the network 160 via line 321 to the correct customers.

Then, at col. 5, lines 1-9:

> As shown in FIG. 7, a switching request 700 can include **a destination address 701 and a source address 702 of the data being routed**. In addition, the switching request 700 can include a priority code 703. The request data 701-703 can be prepended with a header (HDR) 704 to indicates routing information. For example, the header 704 can include the bus address of the arbiter 600. An error correcting code (CRC) 705 can be appended to ensure correct transport of the switching request 700.

Then, at col. 3, line 64 through col. 4, line 39, cited by the Examiner, Rege states the following:

> As shown in FIG. 4, a preferred embodiment of the switch 400 includes a plurality of switching elements 500 and an arbiter 600. Each switching elements 500 is bi-directional to allow data to be transferred between the servers 300 and to the disk systems 800. The elements 500 are connected as a crosspoint mesh. Lines 401, 402, and lines 403 (dashed) respectively connect the elements 500 to the servers 300, the disks 800, and the arbiter 600.
>
> During operation of the switch 400, the arbiter 600 can selectively connect, **based on the switching requests and priority information**, any of the servers 300 to any of the disk systems 800.
>
> As shown in FIG. 5, each of the plurality of switching element 500 includes a first AND gate 510 and a first register 511, and a second AND gate 520 a second register 521. The first AND gate and register 510-511 route multimedia content from the disk systems 800 to the servers 300. The second AND gate and register 520-521 route multimedia content from the servers 300 to the disk systems 800.
>
> Therefore, the first AND gate 510 has one input connected to an output of a specific one of the disk systems 800 by line 501. The output of the AND gate 510 is connected to an input of a specific one of the servers 300 by line 531. The second AND gate 520 has one input connected to an output of the specific server by line 502, and the output is connected to an input of the specific disk system by line 541. The second inputs of the gates 510 and 520 are respectively connected to registers 511 and 521. The registers can be accessed via lines 551-552 by the arbiter 600.
>
> It should be noted that the lines and components can be configured to carry multiple data signals in parallel. For example, the lines, gates and registers and busses can carry 8, 16, 32, 64, or more bits at the time.
>
> During the operation of the switch element 500, the arbiter 600, **in response to switching requests** received from the servers 300 or disk systems 800 via the LAN 210 can set the registers 511 and 521 to either a logical zero or one. If a register is set to a logical one, multimedia content is presented at the output of the gates, otherwise, routing of content through the gate is disabled. By

> selectively setting the registers routing between any server and disk system can be enabled.

Applicant respectfully submits that connecting disks to servers in response to, and based upon, switching requests having destination address information embedded therein expressly teaches away from Applicant's invention of independently routing requests and responses based upon directory information obtained by the processor, as recited for example, in claim 1.

Applicant notes as an aside that by suggesting Rege teaches away from Applicant's claimed invention, Applicant is not arguing against the references individually. Applicant is arguing against the combination of Rege and Belknap. However, to determine the scope and content of the combination of prior art references, as required by the Supreme Court in *Graham,* which was reaffirmed in *KSR*, it is necessary to first understand what each reference teaches individually. Said differently, to know the sum of A and B, one must first define A and define B. Applicant will show that Belknap does nothing to correct this deficiency momentarily.

Turning back to Rege, Rege reiterates the dependency upon the switching requests for routing in other passages cited by the Examiner. For example, at col. 4, lines 56-67, Rege states the following:

> **In response to the switching requests**, the arbiter 600, if possible, sets the appropriate switching elements 500. If the required elements are busy the requests can be queued. After the switching elements 500 have been set via lines 551-552 of FIG. 5, the arbiter 600 can notify the requesting servers 300 or disk systems 800 so that the transfer of content may proceed. Upon completion, the requesting servers or disk systems notifies the arbiter 600 so that the status of the switching elements can be updated in the state table 634. The switching requests can be data messages transported over the LAN 210 using conventional, for example, FDDI or Ethernet protocols.

Turning back to the final Office Action, and to the combination of Rege and Belknap, the Examiner states that Rege teaches the following for the combination at page 6:

Rege teaches servers 300 generate request packets that are sent to disks 800 when a request from a customer is received. The request includes a header, disc address field, size field, server memory address field, and error correction field. The disk address is the logical address of the portion of the selected multimedia to be transferred to the server 300 from the disk 800 (col. 6, lines 6-46).

At col. 6, lines 6-46, Rege discloses the following:

FIG. 10 shows a preferred embodiment of a data request packet 1000 generated to initiate a transfer of content from one of the disk systems 800 to one of the servers. The multimedia request packet 1000 includes a header (HDR) 1010, a disk address field 1020, a size field 1030, a server memory address field 1040, and a error correction field (CRC) 1050.

The header 1010 includes LAN address information to send the data request packet 1000 to the correct disk system 800. For example, the information can include the address of the server making the request. The disk address 1020 is the logical address of the portion of the selected multimedia to be transferred to the server 300. The field 1030 indicates the size, for example byte count, of the content being transferred. The server memory address 1040 is a beginning location in the DRAM 350 of the server 300 where the content portion should be stored. The CRC 1050 can be used to ensure that the packet 1000 is delivered correctly.

In response to customer demands, for example a demand for a selected movie, the "destination" server for content generates appropriate data request packets 1000. The packets are preferably routed to one of the disk systems 800 and queued via the LAN 210. Alternatively, the request packet can be routed to the destination via the switch.

The disk system 800 which will source the content extracts the fields 1020, 1030, and 1040 to fetch the data of the content from the attached disks 820. The requested content is buffered in the cache 832. When the routing between the destination server and the sourcing disk system is enabled by the arbiter 600, the DMA engine 840 can push the multimedia content into the memory of the server beginning at the address 1040.

> A disk system can have multiple transfer requests outstanding for different servers 300. Thus, should one of the servers be busy, another request can be processed.
>
> The packets 1000 can also include other types of packets, indicating, for example, load information, server, switch and disk failures, rerouting information, priority information, or other positional information necessary for delivery of multimedia content to the customer.

Applicant respectfully submits that this passage teaches only conventional switching that is dependent upon source and destination information embedded in the requests. There is no teaching of **independently** routing requests **based on directory information obtained by the processor** as recited in Applicant's claim 1. Belknap does nothing to correct this deficiency. For this reason alone, Applicant respectfully submits its invention is patentable over the combination of Rege and Belknap, as the combination relies upon address data embedded within the request, which expressly teaches away from Applicant's invention.

The above notwithstanding, there are even more reasons why Applicant's invention is patentable over the combination of Rege and Belknap. Applicant now turns its attention to another limitation found in claim 1, the limitation of "…independently routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor, and wherein the data comprises video stream data." At page 6, the Examiner states, "Rege is silent on disclosing wherein the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data."

The Examiner then relies upon Belknap to teach this additional limitation. However, as Applicant will show, Belknap fails to teach such a limitation. The Examiner, at page 7 of the final Office action, submits that Belknap, in analogous art, discloses a system in FIG. 1 for retrieving data distributed across a plurality of devices in FIG. 2 and at col. 6, lines 22-52. The final Office Action submits that Belknap teaches a switch in FIG. 1 that routes a request for retrieving data from the designated processor directly to

the storage devices containing the requested data based upon directory information at col. 7, lines 4-7 and 53-67, and at col. 8, lines 41-53 and col. 9, lines 8-31.

Applicant respectfully submits that this is just not the case. At col. 6, lines 22-52, Belknap discloses the following:

> A video optimized stream server system 10 (hereafter referred to as media streamer) is shown in FIG. 1 and includes four architecturally distinct components to provide scaleability, high availability and configuration flexibility. The major components follow:
>
> 1) Low Latency Switch 12: a hardware/microcode component with a primary task of delivering data and control information between Communication Nodes 14, one or more Storage Nodes 16, 17 and one or more Control Nodes 18.
>
> 2) Communication Node 14: a hardware/microcode component with the primary task of enabling the "playing" (delivering data isochronously) or "recording" (receiving data isochronously) over an externally defined interface usually familiar to the broadcast industry: NTSC, PAL, D1, D2, etc. The digital-to-video interface is embodied in a video card contained in a plurality of video ports 15 connected at the output of each communication node 14.
>
> 3) Storage Node 16, 17: a hardware/microcode component with the primary task of managing a storage medium such as disk and associated storage availability options.
>
> 4) Control Node 18: a hardware/microcode component with the primary task of receiving and executing control commands from an externally defined subsystem interface familiar to the computer industry.

To be sure, simply disclosing a “low latency switch” fails to teach a switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data, as recited in Applicant’s claim 1. It is well understood by those of ordinary skill in the art that many switches are marketed as “low latency” due to their switching properties. Such a moniker is not based upon the source or destination of data routed through these switches.

The case is the same considering the next passage referred to by the Examiner, col. 7, lines 4-7 and 53-67:

> Information is transferred through the switch 12 in packets. Each packet contains a header portion that controls the switching state of individual crossbar switch points in each of the switch chips. The control node 18 provides the other nodes (storage nodes 16, 17 and communication nodes 14) with the information necessary to enable peer-to-peer operation via the low latency switch 12.

and

> In FIG. 1C, internal details of a disk storage node 16 are shown. Each disk storage node 16 includes a switch interface and buffer module 40 which enables data to be transferred from/to a RAID buffer video cache and storage interface module 42. Interface 42 passes received video data onto a plurality of disks 45, spreading the data across the disks in a quasi-RAID fashion. Details of RAID memory storage are known in the prior art and are described in "A Case for Redundant Arrays of Inexpensive Disks (RAID)", Patterson et al., ACM SIGMOD Conference, Chicago, Ill., Jun. 1-3, 1988 pages 109-116.

Just as with the previous citation, these passages do nothing other than refer to the switch as a "low latency" switch. There is no teaching of a switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data, as recited in Applicant's claim 1.

Continuing to the next passage relied upon by the Examiner, col. 8, lines 41-53, this passage recites the following:

> Each control node 18 is configured as a PC and includes a switch interface module for interfacing with low latency switch 12. Each control node 18 responds to inputs from system controller 64 to provide information to the communication nodes 14 and storage nodes 16, 17 to enable desired interconnections to be created via the low latency switch 12. Furthermore, control node 18 includes software for enabling staging of requested video data from one or more of disk storage nodes 16 and the delivery of the video data, via a stream delivery interface, to a user display terminal. Control node 18 further controls the operation of both tape and disk storage nodes 16, 17 via commands sent through low latency switch 12.

Again, this is nothing more than another recitation of a low-latency switch. There is no teaching of a switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data, as recited in Applicant's claim 1. Applicant respectfully resubmits, where there are differences, an Office Action "…must explain why the difference(s) would have been obvious to one of ordinary skill in the art." MPEP §2141, citing *KSR*.

There is no explanation in the record of why it would have been obvious to substitute Applicant's "switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data" for the low-latency switch of the combination of Rege and Belknap. Applicant respectfully submits that it would *not* be obvious to do so, for the reasons set forth herein. Applicant respectfully notes, "The examiner must consider any evidence supporting the patentability of the claimed invention, such as any evidence from the specification or any other evidence submitted by the applicant." MPEP §2142. In view of the distinctions between the combination of Rege and Belknap and Applicant's invention, Applicant respectfully submits its claims 1 and 13 are patentable over the combination.

Nonetheless, continuing with portions of Belknap relied upon by the Examiner in making the rejection, col. 9, lines 8-31 recite the following:

> When commands are issued over the control interface to start the streaming of data to an end user, control node 18 selects and activates an appropriate communication node 14 and passes control information indicating to it the location of the data file segments on the storage nodes 16, 17. The communications node 14 activates the storage nodes 16, 17 that need to be involved and proceeds to communicate with these nodes, via command packets sent through the low latency switch 12, to begin the movement of data.
>
> Data is moved between disk storage nodes 16 and communication nodes 14 via low latency switch 12 and "just in time" scheduling algorithms. The technique used for scheduling and data flow control is more fully described below. The data stream that is emitted from a communication node interface 14 is multiplexed to/from disk storage nodes 16 so that a single communication node stream uses a fraction of the capacity and bandwidth of each disk storage node 16. In this way, many communication nodes 14 may multiplex access to the same

> or different data on the disk storage nodes 16. For example, media streamer 10 can provide 1500 individually controlled end user streams from the pool of communication nodes 14, each of which is multiplexing accesses to a single multimedia file spread across the disk storage nodes 16. This capability is termed "single copy multiple stream".

This passage discloses only multiplexing data streams from disks. There is nothing in this passage, as there is nothing in the Belknap reference itself, that discloses a switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data, as recited in Applicant's claim 1.

As described above, the combination of Rege and Belknap does not render Applicant's invention obvious. The disclosure of Rege fails to teach for the combination of Rege and Belknap Applicant's limitation of "of independently routing requests and responses based upon directory information obtained by the processor." Belknap fails to remedy this deficiency for the combination.

Similarly, the disclosure of Belknap fails to teach the combination of Rege and Belknap to achieve Applicant's limitation of "switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data." Rege fails to remedy this deficiency.

For these reasons alone, Applicant respectfully submits that its invention, as recited in the independent claims, is patentable over the combination of Rege and Belknap.

The above notwithstanding, there are still *further* reasons why Applicant's invention is patentable over the combination of Rege and Belknap. Applicant has set forth in full detail how the combination of Rege and Belknap fails to teach Applicant's limitations, such as those cited in claims 1 and 13. Applicant further notes that the references themselves cannot be modified to obtain Applicant's invention, as that modification would change the principle of operation of those references. Specifically, such a modification would change the operation of the Rege reference in the combination of Rege and Belknap. Applicant respectfully notes, "If the proposed modification or

combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious." *In re Ratti*, *supra*.

In the present case, the switch of Rege, as set forth above, routes data based upon addressing information embedded in the switching request. See, e.g., Rege, col. 5, lines 1-3. As shown above by Applicant, Rege's arbiter does not independently route information, but rather relies upon the switching requests to set the registers between servers and disks. See, e.g., Rege, col. 4, lines 31-39. Modifying the arbiter of Rege to independently route requests and responses based upon directory information obtained by the processor would change the operation of the arbiter of Rege, which controls the switch. Thus, it would also change the operation of the switch.

Applicant notes that there is no clear articulation, with a rational underpinning, why someone would be motivated to make such a change, absent using Applicant's disclosure and impermissible hindsight. For this reason alone, Applicant respectfully submits that its invention, as recited in Applicant's independent claims, is allowable over the combination of Rege and Belknap.

Upon making similar arguments in the response filed on June 30, 2009, the Examiner responded in the final Office Action mailed August 29, 2008. Applicant now wishes to address the remarks made by the Examiner in response to the information set forth above.

In response to Applicant's argument that Rege fails to disclose, for the combination of Rege and Belknap, "a switch independently routing requests and responses based upon directory information obtained by the processor," the Examiner states as follows:

> Rege discloses server 300 or "processor" receives request from media devices. Server 300 generates a switching request 700 and sends the request to the arbiter 600 which is included in switch 400 (figure 4; Col. 3, lines 64-66). Further arbiter 600 sets the switches based on the information in the switching request 700, wherein the switching request 700 includes a source address and a destination address.

Applicant respectfully notes that this is exactly Applicant's point: the arbiter 600 sets the switches **based on the information in the switching request 700**, wherein the switching request includes a source address and the destination address. Applicant notes that this is **not** directory information obtained by the processor used to independently route requests and responses. Rege teaches dependent switching, the dependency stemming from the request. Applicant's invention recites independent switching. Again, Applicant respectfully notes, "All the words in a claim must be considered in judging the patentability of that claim against the prior art." MPEP §2143.03.

Next, in response to Applicant's argument that Belknap fails to teach of a "switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data," the Examiner states as follows:

> Belknap discloses a switch 12, wherein the switch 12 independently routes a request, that is by accessing the header of the request which controls the switching within switch 12 (Col. 7, lines 4-7, for retrieving data from the designated processor directly to the storage devices containing the requested data based on directory information obtained by the processor, that is storage devices comprises RAID mapping or "directory information" for the processors to facilitating [sic] switching requests (col. 7, lines 53-67).

Applicant respectfully disagrees. Beginning with Belknap, col. 7, lines 4-7, as already recited and discussed above above, Belknap states:

> Information is transferred through the switch 12 in packets. Each packet contains a header portion that controls the switching state of individual crossbar switch points in each of the switch chips. The control node 18 provides the other nodes (storage nodes 16, 17 and communication nodes 14) with the information necessary to enable peer-to-peer operation via the low latency switch 12.

Applicant respectfully submits that, contrary to the Examiner's submission, there is no teaching here of independently switching. Instead, as in Rege, Belknap expressly relies upon a header "…that **controls** the switching state of individual crossbar switch points…" This is simply not independent switching. Applicant has already shown above

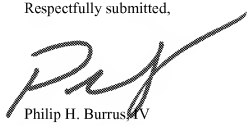
that col. 7, lines 53-67, do nothing to rectify this deficiency. The same is true with col. 9, liens 8-31, upon which the Examiner relies.

For these reasons, set forth herein, Applicant respectfully submits that its independent claims are allowable over the combination of Rege and Belknap. Applicant respectfully requests allowance of the claims in their present form.

CONCLUSION

For the above reasons, Applicants believe the specification and claims are in proper form, and that the claims all define patentably over the prior art. Applicants believe this application is in condition for allowance, for which they respectfully submit.

Respectfully submitted,



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404-797-8111

CLAIMS APPENDIX

Listing of Claims:

1. (Previously Presented) A system for retrieving data distributed across a plurality of storage devices, the system comprising:

a plurality of processors, wherein upon receipt of a request for retrieving data, a processor is designated for handling the request; and

a switch arranged between the processors and the storage devices, wherein the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data based on directory information obtained by the processor, and independently routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor, and wherein the data comprises video stream data.

2. (Original) The system of claim 1, further comprising a resource manager for designating a processor to handle a request, based on the load on each processor.

3. (Canceled)

4. (Previously Presented) The system of claim 1, wherein the processor obtains the directory information from the storage devices.

5. (Original) The system of claim 1, further comprising at least one high speed network connected to the storage devices and arranged between the switch and the storage devices.

6. (Original) The system of claim 5, wherein the switch accommodates a plurality of high speed networks and connected storage devices.

7. (Original) The system of claim 5, wherein the high speed network is a fiber channel network, a Small Computer Systems Interface (SCSI) network, or an Ethernet network.

8. (Canceled)

9. (Original) The system of claim 1, wherein the storage devices are disk drives.

10. (Original) The system of claim 9, wherein the data is stored in a Redundant Array of Inexpensive Disks (RAID) format among the disk drives.

11. (Original) The system of claim 1, further comprising a high speed network for delivering the retrieved data from the designated processor to a client device.

12. (Original) The system of claim 11, wherein the high speed network is an Ethernet network, an Asynchronous Transfer Mode (ATM) network, a Moving Pictures Expert Group (MPEG) 2 Transport network, a Quadrature Amplitude Modulated (QAM) cable television network, a Digital Subscriber Loop (DSL) network, a Small Computer Systems Interface (SCSI) network, or a Digital Video Broadcasting – Asynchronous Serial Interface (DVB-ASI) network.

13. (Previously Presented) A method for retrieving data distributed across a plurality of storage devices, the method comprising the steps of:

receiving a request for retrieving data, wherein the data comprises video stream data;

designating a processor for handling the request;

forwarding the request directly from the designated processor to the storage devices containing the data via a switch; and

returning responses from the storage devices directly to the designated processor via the switch, wherein the switch uses directory information obtained by the processor to independently route the request for retrieving data and the responses between the storage devices and the processor.

14. (Original) The method of claim 13, wherein the step of designating a processor includes performing load balancing on the processors and designating a processor based on the load balancing.

15. (Canceled)

16. (Previously Presented) The method of claim 13, wherein the processor obtains the directory information from the storage devices.

17. (Original) The method of claim 13, wherein the request is forwarded from the processor to the storage devices via at least one high speed network connected to the storage devices.

18. (Original) The method of claim 17, wherein the switch accommodates a plurality of high speed networks and connected storage devices.

19. (Original) The method of claim 17, wherein the high speed network is a fiber channel network, a Small Computer Systems Interface (SCSI) network, or an Ethernet network.

20. (Canceled)

21. (Original) The method of claim 13, wherein the storage devices are disk drives.

22. (Original) The method of claim 21, wherein the data is stored in a Redundant Array of Inexpensive Disks (RAID) format among the disk drives.

23. (Original) The method of claim 13, further comprising delivering the retrieved data from the designated processor to a client device via a high speed network.

24. (Original) The method of claim 23, wherein the high speed network is an Ethernet network, an Asynchronous Transfer Mode (ATM) network, a Moving Pictures Expert Group (MPEG) 2 Transport network, a Quadrature Amplitude Modulated (QAM) cable television network, a Digital Subscriber Loop (DSL) network, a Small Computer Systems Interface (SCSI) network, or a Digital Video Broadcasting – Asynchronous Serial Interface (DVB-ASI) network.

25-52 (Canceled)

53. (Withdrawn)

54. (Withdrawn)

EVIDENCE APPENDIX

There are no evidentiary submissions included with this brief.

RELATED PROCEEDINGS INDEX

No decisions have been rendered by either the Board or a court having appropriate jurisdiction.